

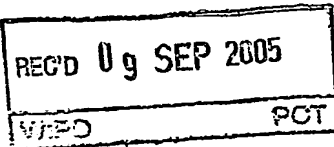
# PATENT COOPERATION TREATY


# PCT

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)



|  |  |   |  |  |
|--|--|---|--|--|
| Applicant's or agent's file reference<br>0000054958  |  | <b>FOR FURTHER ACTION</b>   |  | See Form PCT/PEA/416                         |
| International application No.<br>PCT/EP2004/011255   |  | International filing date (day/month/year)<br>08.10.2004                          |  | Priority date (day/month/year)<br>10.10.2003 |
| International Patent Classification (IPC) or national classification and IPC<br>C08L77/02, C08G69/48, C08L77/00  |  |   |  |  |
| Applicant<br>BASF AKTIENGESELLSCHAFT et al   |  |   |  |  |
| <p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 4 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> sent to the applicant and to the International Bureau a total of 3 sheets, as follows:</p> <p><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p> |  |   |  |  |
| <p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>   |  |   |  |  |
| Date of submission of the demand<br><br>23.02.2005   |  | Date of completion of this report<br><br>08.09.2005                               |  |  |
| Name and mailing address of the international preliminary examining authority:<br> European Patent Office<br>D-80298 Munich<br>Tel. +49 89 2399 - 0 Tx: 523656 epmu d<br>Fax: +49 89 2399 - 4465  |  | Authorized Officer<br><br>Otegui Rebollo, J<br><br>Telephone No. +49 89 2399-8670 |  |  |



**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/EP2004/011255

**Box No. I Basis of the report**

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:

- ☐ international search (under Rules 12.3 and 23.1(b))
- ☐ publication of the international application (under Rule 12.4)
- ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the **elements\*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

**Description, Pages**

1-34 as originally filed

**Claims, Numbers**

1-10 received on 23.07.2005 with letter of 22.07.2005

☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing *(specify)*:
- ☐ any table(s) related to sequence listing *(specify)*:

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing *(specify)*:
- ☐ any table(s) related to sequence listing *(specify)*:

\* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/EP2004/011255

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**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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**1. Statement**

|                               |             |      |
|-------------------------------|-------------|------|
| Novelty (N)                   | Yes: Claims | 1-10 |
|                               | No: Claims  |      |
| Inventive step (IS)           | Yes: Claims |      |
|                               | No: Claims  | 1-10 |
| Industrial applicability (IA) | Yes: Claims | 1-10 |
|                               | No: Claims  |      |

**2. Citations and explanations (Rule 70.7):**

**see separate sheet**

**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement**

The following documents are referred to in this communication:

- D3: WO 02/102885 A (BASF AG ; BASF CORP (US)) 27 December 2002 (2002-12-27)  
D4: EP-A-0 784 080 (DSM NV) 16 July 1997 (1997-07-16)

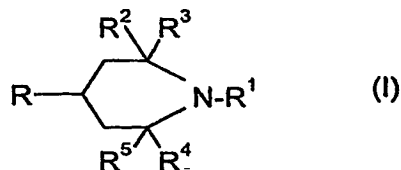
The invention basically relates to a thermoplastic blend comprising a piperidine-capped polyamide (A) in admixture with a graft-copolymer such as an ABS (C) and the necessary compatibiliser (B).

The nearest state of the art is considered to be D3 as it discloses polymer blends comprising a piperidine-capped polyamide (A) in admixture with an ABS (see in particular claim 7 read in conjunction with page 7, lines 36 to 41 and page 12, lines 5 to 17). The skilled person would have been aware that when preparing these blends a compatibilizer is needed. Therefore, they would have looked in the available prior art for useful additives for compatibilization purposes. In so doing they would have undoubtedly come to consider the teachings of D4 as represented by the examples thereof, adding the compatibilizing agent (C) from D4 into the polymer blends of D3. Thus, performing the claimed invention in a natural obvious manner (Article 33(3) PCT). The problem underlying the application as recited in the paragraph bridging pages 2 and 3 of the application appears to be common in the art, and implicit to any activity in the polyamide moulding field. Furthermore, the examples of the application do not provide any evidence that a more particular problem may have been solved because the teachings of D3 were not considered therein, and the addition of the polymer blends of D3 with a compatibilizing agent appears to be obvious step in itself.

We claim

1. A thermoplastic molding composition, comprising

5 A) a polyamide A1), containing at least one end group derived from a piperidine compound of the formula (I)



where

10 R is an amide-forming group R⁷ or a functional group R⁸ which bears from 1-4 identical or different amide-forming groups R⁷,  
 R¹ is H, C₁-C₂₀-alkyl, cycloalkyl, benzyl, or OR⁶, where  
 R⁶ is H, C₁-C₂₀-alkyl, cycloalkyl, or benzyl,  
 15 R², R³, R⁴ and R⁵, independently of one another, are C₁-C₁₀-alkyl, where R¹, R², R³, R⁴ and R⁵ may be different or identical, and  
 R⁷ has been selected from the group consisting of -(NHR⁹), where R⁹ is H, alkyl having from 1 to 8 carbon atoms, cycloalkyl having from 3 to 10 carbon atoms, or alkylene having from 2 to 20 carbon atoms, carboxy, and carboxylic acid derivatives, and

20

B) a copolymer, selected from

B1) a rubber-free random copolymer, containing, as monomeric units,

25 b11) a styrene monomer,  
 b12) a monomer which contains a functional group which can react with the end groups of the polyamide present in component A), and  
 b13) a monomer which contains no functional groups which react with the end groups of the polyamide present in component A),

30

and

B2) a block copolymer of Y-X structure, containing

35 B21) from 95 to 99.5% by weight of block Y, containing, as monomeric units,  
 b21) a mixture composed of  
 b211) a styrene monomer, and  
 b212) a comonomer other than maleic anhydride, or  
 b22) an ethylenically unsaturated ester

40

and

5 B22) from 0.5 to 5% by weight of block X, composed of a styrene monomer and of a copolymerizable anhydride, or of a copolymerizable acid, or of a mixture of these, as monomeric units, where the block X has, in essence, a strictly alternating structure;

where the entirety of the components B21) and B22) is 100%, and

10 C) a graft copolymer C1), containing a diene rubber as graft base c11) and a graft c12) based on an unsaturated monomer.

2. A thermoplastic molding composition as claimed in claim 1, where the polyamides A) have at least one end group derived from a piperidine compound, where R is a group of the formula  $-NH-R^8-NH-$ , where  $R^8$  is an alkylene group having from 1 to 20 carbon atoms.

3. A thermoplastic molding composition as claimed in claim 1 or 2, where component A) is a mixture composed of polyamide A1) and of a polyamide A2) which contains no end groups which derive from a piperidine compound.

20 4. A thermoplastic molding composition as claimed in any of claims 1 to 3, where, as additional component, a rubber-free matrix polymer C2) is present, which in essence comprises, as monomeric units,

25 c21) a styrene monomer or a (meth)acrylic ester, and, if desired,

c22) an unsaturated nitrile, maleimide, or maleic anhydride, or a mixture of these.

30 5. A thermoplastic molding composition as claimed in any of claims 1 to 4, where component C) is a mixture composed of two graft copolymers C1) whose rubber contents differ from one another by at least 5% by weight.

35 6. A thermoplastic molding composition as claimed in any of claims 1 to 5, comprising from 0.3 to 1.5% by weight, based on the total weight of the molding composition, of a stearate or silicone oil, or a mixture of these.

40 7. A process for preparing thermoplastic molding compositions as claimed in any of claims 1 to 6, which comprises, in a first step, preparing a graft copolymer P) from a portion of component A) and the entire amount of component B), and, in a second step, mixing the graft copolymer P) with the other components and with the remaining amount of component A).

- 5
8. The use of the thermoplastic molding compositions as claimed in any of claims 1 to 6, or prepared as claimed in claim 7, for producing moldings, foils, fibers, or foams.
9. A molding, a foil, a fiber, or a foam, obtainable using thermoplastic molding compositions as claimed in any of claims 1 to 6, or prepared as claimed in claim 7.
- 10
10. A vehicle-interior component obtainable using moldings, foils, fibers, or foams as claimed in claim 9.